

# ***Earned Value***

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**A Manager's Tool for Integrated  
Cost, Schedule and Technical  
Performance Management**

***OUSD(A&T)SA/PM***

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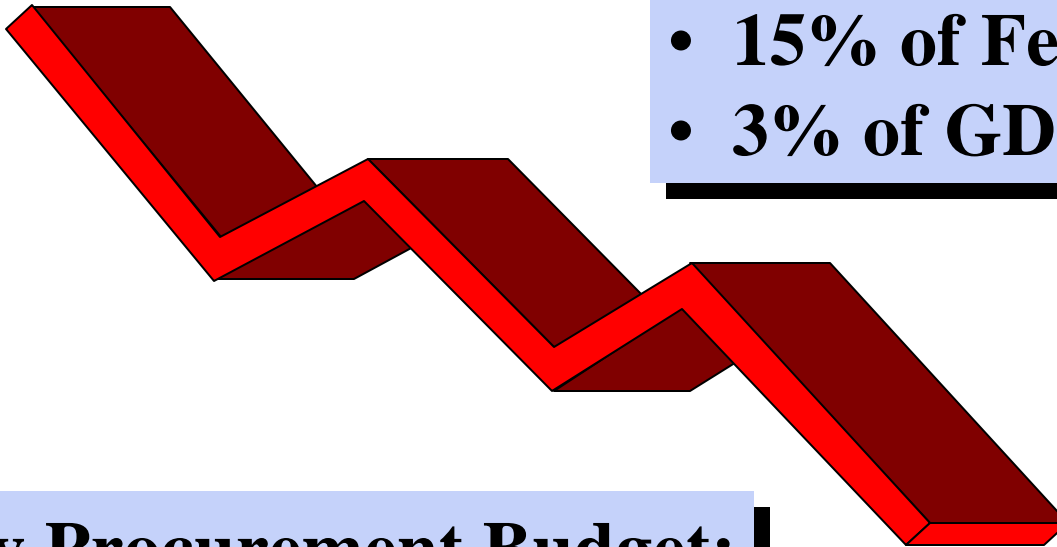
## 1961 Pentagon Spending:

- 40% of Federal Budget
- 8% of GDP

## 1997 Pentagon Spending:

- 15% of Federal Budget
- 3% of GDP

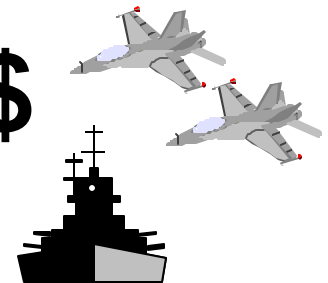
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## Military Procurement Budget:

- Down 67% since 1985 peak
- \$60 Billion goal

\$



*The 1990's - Shrinking Industrial Base*

Lockheed  
GD Mil. Jets  
Sanders Assoc.



**Lockheed**

Martin Marietta  
GD Rockets  
GE Aerospace



**Martin Marietta**

Loral  
Unisys Defense  
IBM Fed. Systems  
LTV Missiles



**Loral**

Ford Aerospace  
Goodyear Aerospace



Northrop  
LTV Aircraft  
Grumman  
Westinghouse Def



**Boeing**  
**Rockwell Def & Space**  
**McDonnell Douglas**



**Lockheed Martin**



**Northrop Grumman**

Boeing  
Rockwell Def & Space  
McDonnell Douglas  
Raytheon  
E-Systems



**Raytheon**

Texas Instruments Def  
Hughes Aircraft  
Magnavox Def  
CAE Link  
GD Missiles



**Texas Instruments Def**

**Hughes Aircraft**



**Boeing**



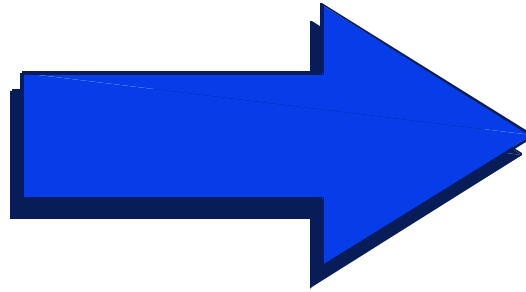
**Raytheon**

# Reengineering EVMS

## October 1993 - A Vision



**Inspection**



**Management**



# Earned Value Management: Implementation Problems

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- “Financial Management”
- Audit-like reviews
- **Reporting** focus
- Too many “surprises”
  - ◆ **A-12** (Navy)
  - ◆ **AAWS-M** (Army)
  - ◆ **C-17** (Air Force)
- Challenge: **keep good principles, stop bad practices**



# Lesson of the A-12

The “Beach” Report, A-12 Administrative Inquiry, 28 Nov 1990

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- Too often, earned value insights remain the sole province of the supporting program control staff of both contractors and the government.
  - ◆ Earned value must be an **integral** part of the performing design and manufacturing organizations.
  - ◆ Only when **program technical staffs** are held accountable for earned value analysis, will they begin to understand its implications.

# **The Need For Change:**

## **C/SCSC never had a chance!**

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- **RFP Review Results 1991 - 1993**
- **Significant misapplication of requirements**
  - ◆ 50% have WBS problems
  - ◆ 75% have excessive variance reporting requirements



# *Unnecessary Cost*

**December, 1994, Coopers & Lybrand/TASC Study:**

**“The DoD Regulatory Cost Premium:  
A Quantitative Assessment”**

**and**

**COST/SCHEDULE CONTROL SYSTEMS  
(C/SCS)**

# ***C&L/TASC Cost Drivers:***

## ***Cost without a requirement***

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- **Total DoD Cost Premium is 18%**
- **C/SCS Cost Premium is 0.9%**
  - ◆ Nearly 3/4 is in Eng'g/Prog Mgmt
    - Written control account variances
  - ◆ Most of Remainder is in administrative and external reporting activities

# Good idea, bad implementation

## (C&L/TASC Cost Drivers)

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- “In general, **industry views** the general framework and principles of cost/schedule reporting **positively**.
- However, all contractors subject to C/SCS agree that, **as currently required** by DoD, cost/schedule reporting is **too detailed, repetitive, and voluminous** to be used effectively as a management tool by either the government or industry...”

# The paradigm must change

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- **EVMS** reporting system is of little value;
- Program **M**anagement, not audits;
- The Vision:
  - ◆ The quality of a contractor's management system is determined
  - ◆ not by the absence of defects,
  - ◆ but by the presence of management value.

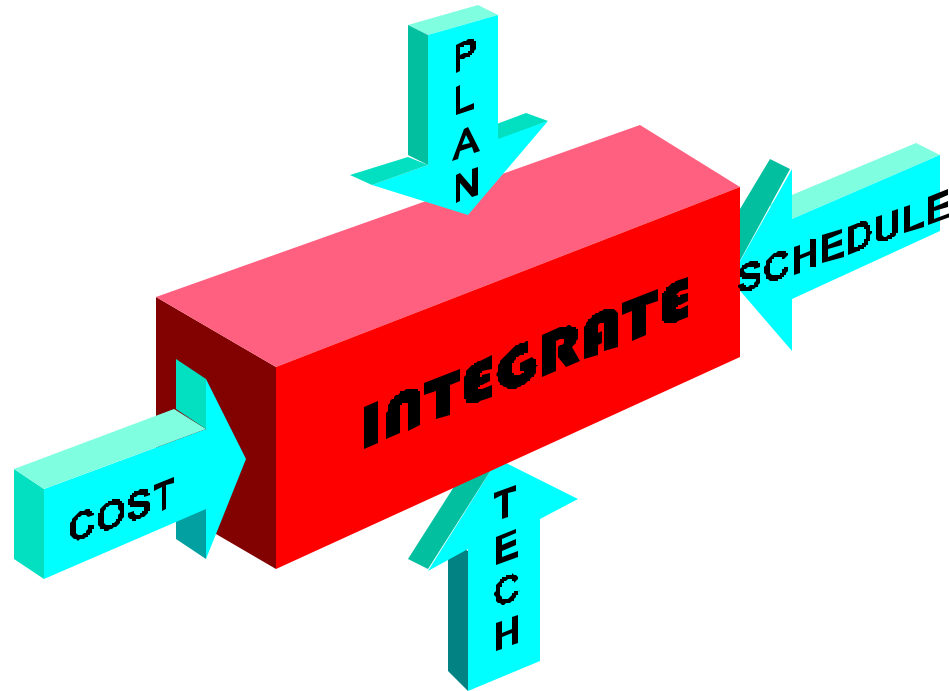
# Services & industry Challenged Implement “Model Program”

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- Initiated Oct 93
- Shift Ownership From Financial Management to **Program Management**
  - ◆ Change emphasis from government system to contractor systems
  - ◆ Reduce the review burden
  - ◆ Limit reporting
  - ◆ Ensure comprehensive **planning** and common understanding of the task
  - ◆ **Integrate** cost, schedule, technical performance, and risk management

# The Acquisition Executives Take Charge

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**INTEGRATED PROGRAM MANAGEMENT INITIATIVE**

**September 1994**

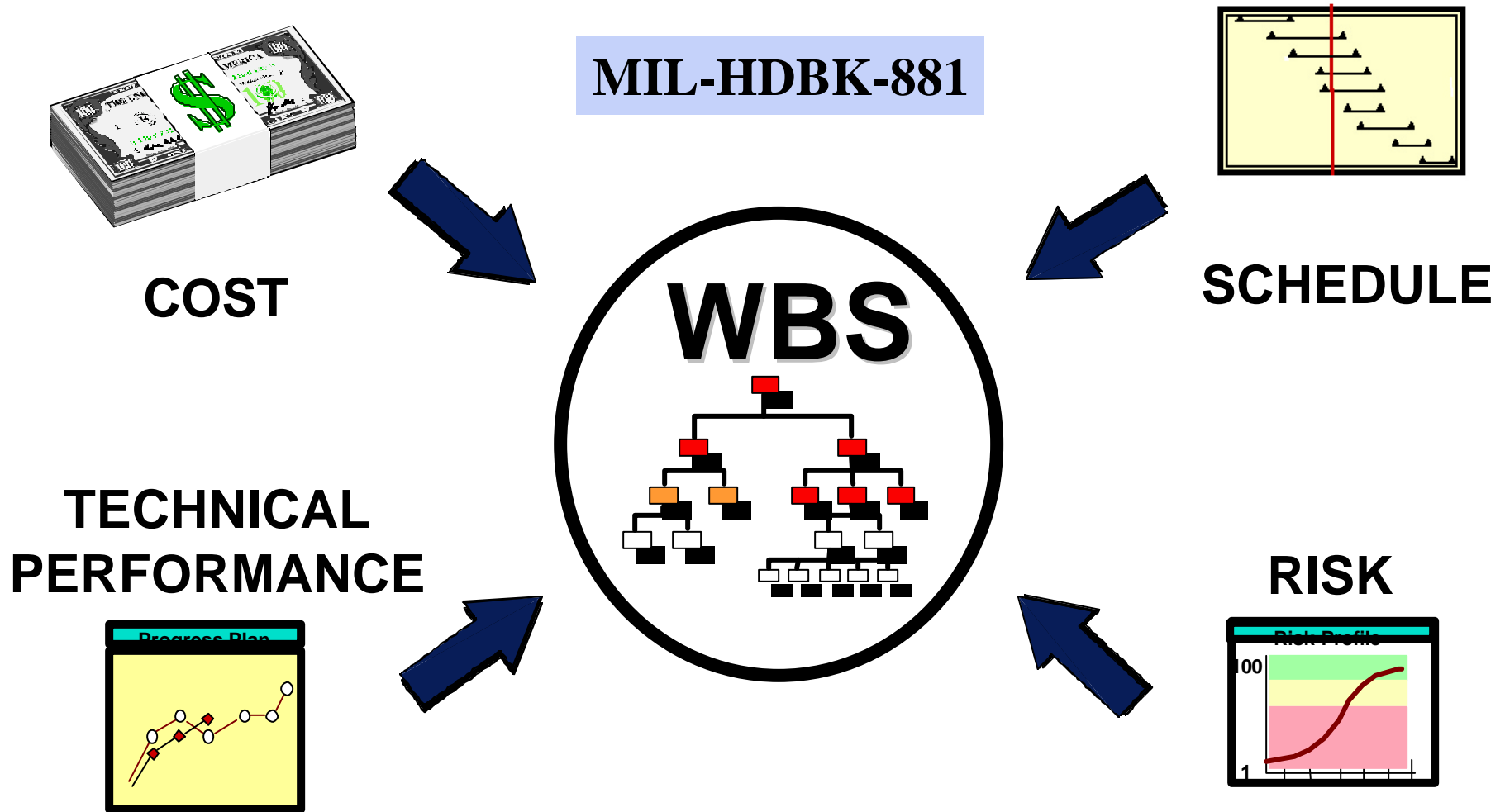
# **Key Building Blocks**

## **Integrated Program Management Initiative**

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- **Model Program Objectives**
- **WBS**
- **IPTs**
- **Integrated Baseline Review (IBR)**
- **“Right Size” Reporting**
- **Integrated Digital Environment**
- **Training**

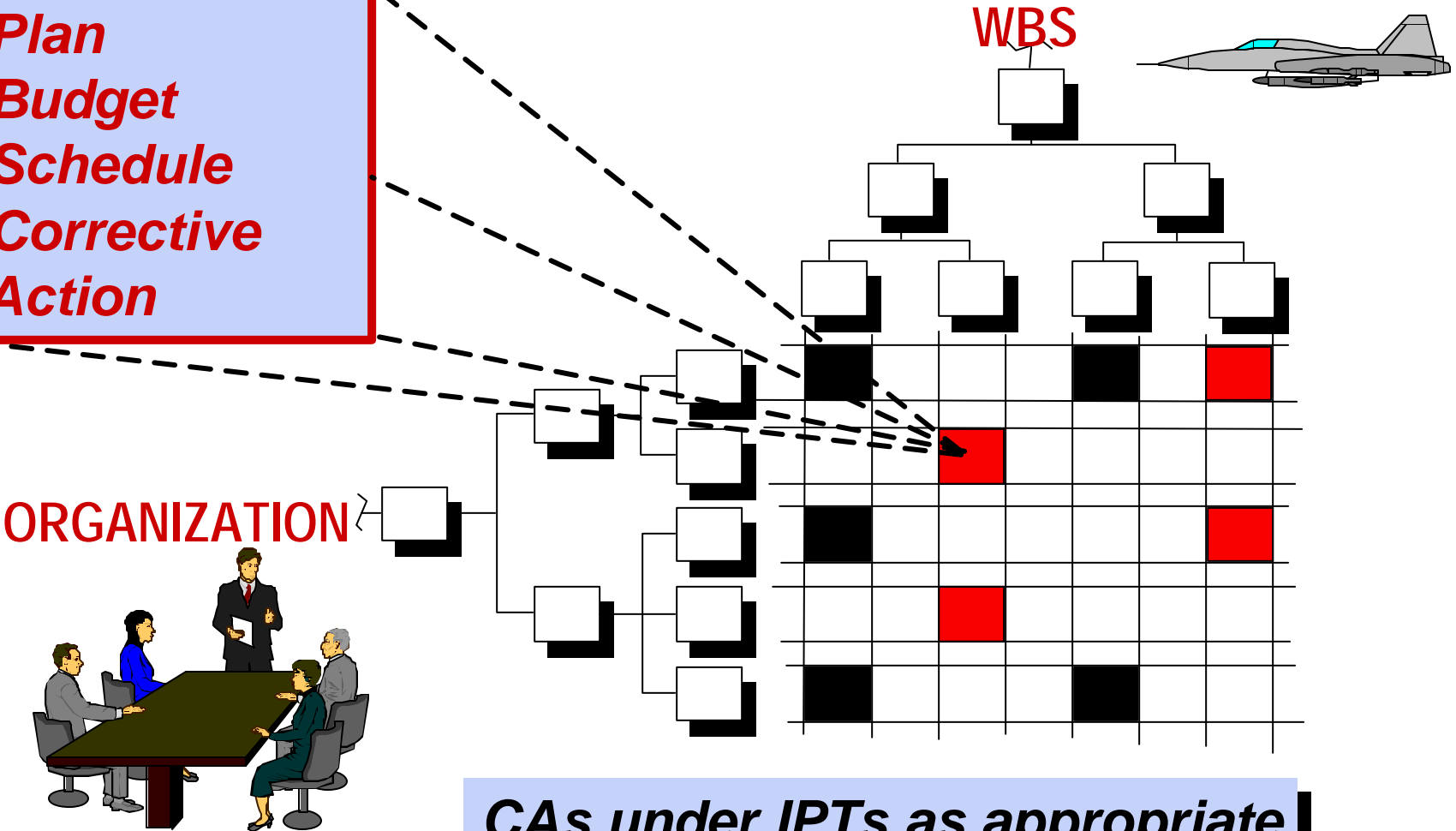
# Work Breakdown Structure: The Key to Integration





# The Control Account: Where the Action is

- ***Plan***
- ***Budget***
- ***Schedule***
- ***Corrective Action***



***CAs under IPTs as appropriate***

# Reengineering EVM: Integrated Baseline Reviews

- Within 6 months of award

- Mutually understand plan

- ◆ Scope
- ◆ Schedule
- ◆ Resources

} **Risk**

- Planning process vs. event

- PM leads

- ◆ EVM staff supports
- ◆ Management system reviews effectively eliminated

IBR Training

- Schedules
- Mgmt. Systems



# **Growing Consensus:**

## **Gov't/Industry Best Practice**

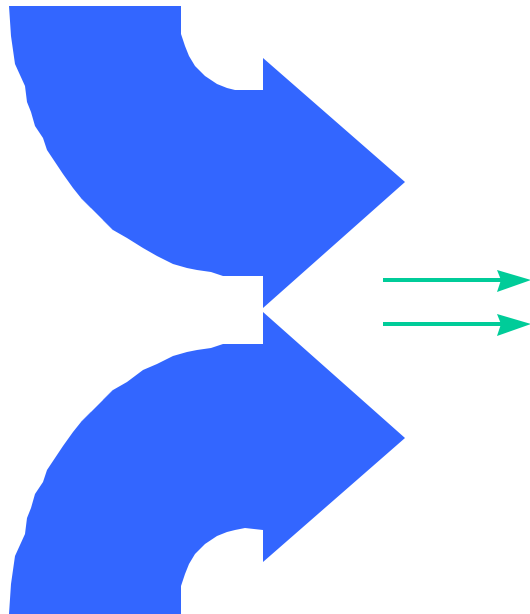
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- **Dec. '96 DoD accepted industry EVMS guidelines as C/SCSC replacement**
- **Reserved right for government reviews**
  - ◆ **As determined by project manager**
  - ◆ **"Self-certification" not in public interest**
- **Encouraged "true" standard**
  - ◆ **ANSI/EIA 748-98 EVMS issued in 1998**
  - ◆ **DoD and industry EVMS criteria are equal**
  - ◆ **International discussions - Australia, Canada, UK, US**



# Earned Value Management: Origins

Industry Best  
Practices



Government  
Requirements

1967: DoD Instruction 7000.2

**CANCELED**

*Criterion-based Management*

- Brief statements of attributes
- Not “how-to manage”
- Not a system
- Minimum acceptable standard

1997: DoD Regulation 5000.2-R  
**32 Earned Value Management  
Systems (EVMS) Criteria**

# DoD Since 1993... Results!

## ● DoD EVM

- ◆ Value reaffirmed
- ◆ Shifted to Industry; DCMC Exec. Agent
- ◆ OMB policy
- ◆ Trilateral MoU
- ◆ Intl. Perf. Mgmt. Council
- ◆ Commercial
- ◆ In-house
- ◆ Prof. associations
- ◆ Adopted by NASA, FAA, NRO, FBI, CoE
- ◆ Enterprise-wide
  - Boeing
  - Raytheon
  - Lockheed Martin
  - and others...
- ◆ No major surprises

**Aggregate overrun 5.5% (\$1.2B on \$72.8B; 66% comp.)**

# They're even doing it in industry!

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- **Industry**

- ◆ Boeing Defense & Space Group
- ◆ Lockheed Martin Sunnyvale
- ◆ McDonnell Douglas
- ◆ Motorola Iridium <sup>tm</sup>
- ◆ Navistar
- ◆ Delta Airlines
- ◆ Delco Electronics
- ◆ Industry "Standard"
  - ANSI

- **Project Management Institute**

# In-house Workshop Tasks

## My Opinions

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- **Validation & Surveillance**

- ◆ Policy changes?
- ◆ Who performs?

- **Implementation**

- ◆ Can in-house meet all 32 criteria?

- **Accounting Systems**

- ◆ Are DoD, non-CAS systems compliant?

- **Data Analysis & Training**

- ◆ Do PMs need EV data?

# Earned Value Management Systems

## Basic requirements

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- **COMPREHENSIVE PLANNING PROCESS**
  - ◆ Covers entire statement of work
  - ◆ Schedules activities
  - ◆ Allocates resources
- **FULLY INTEGRATED MANAGEMENT SYSTEMS**
  - ◆ Scheduling systems integrated with one another, and with work authorization system, accounting system, MRP, work measurement system, etc. For example:
    - Interdependencies between department, functional, and/or IPT schedules (horizontal integration)
    - Interdependencies from lowest level to master schedule (vertical integration)



# VISION

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**The quality of a contractor's management system  
is determined not by the absence of defects,  
but by the presence of management value**